

## Bullet Points for Larry Douchand Briefing April 29, 2021

### Briefest Overview of EPA Superfund Approach Radiation Sites

- The PowerPoint presentation “U.S. EPA Superfund Remedial Program’s Addressing of Radioactive Contamination” provides an overview of the guidance and tools recommended by EPA.
- Since 1991 OSRTI provides guidance for addressing radioactively contaminated remedial Superfund sites consistent with our guidance for addressing chemically contaminated sites (while accounting for the technical differences between radionuclides and chemicals).

### Incorrect Criticisms of Risk Management and Science Underpinnings

- Sometimes incorrect assertions will be made, usually by PRPs, that the EPA CERCLA approach to radionuclides is based on bad science, or is not science based, or has not received sufficient external review.
- The risk management idea of treating radionuclides and chemicals in a similar fashion had been supported by a blue-ribbon committee. In the Framework for Environmental Health Risk Management, developed by the Presidential/Congressional Commission on Risk Assessment and Risk Management, stated in Final Report Volume 2 issued 1997, Risk Assessment and Risk Management In Regulatory Decision-Making on page 82 “**Recommendation** A concerted effort should be made to evaluate and relate the methods, assumptions, mechanisms, and standards for radiation risks to those for chemicals to clarify and enhance the comparability of risk management decisions and investments, especially when both types of hazards are present.” On page 122 of this report, in its Superfund section, it states “**Recommendation** EPA should continue to use its  $10^{-6}$  to  $10^{-4}$  risk range as a guide for site-specific risk-based cleanup goals, related to future land use.” [http://oaspub.epa.gov/eims/eimscomm.getfile?p\\_download\\_id=36372](http://oaspub.epa.gov/eims/eimscomm.getfile?p_download_id=36372)
- In a 1999 NAS report “Evaluation of Guidelines for Exposures to Technologically Enhanced Naturally Occurring”, NAS compared the EPA approach for risk assessment using slope factors (risk coefficients) and NRC’s approach of using effective dose equivalent then converting that to risk, and found EPA’s to be a methodologically more rigorous approach to assessing risk posed by chronic lifetime exposure to radionuclides. On page 223 of the NAS Report it states “The Nuclear Regulatory Commission's approach to estimating risk posed by chronic radiation exposure of the public normally is based on ICRP recommendations on estimating doses per unit exposure and the risk per unit dose... EPA has developed a methodologically more rigorous approach to assessing risk posed by chronic lifetime exposure to radionuclides, which is particularly important for internal exposure and differs in several respects from the simple approach described above.” On page 234 the report states that “This committee offers the following comments on the issue of a limit on acceptable risk and, therefore, acceptable dose. First, the determination of an acceptable risk for any exposure situation clearly is entirely a matter of judgment (risk-management policy) which presumably reflects societal values.” <https://www.nap.edu/catalog/6360/evaluation-of-guidelines-for-exposures-to-technologically-enhanced-naturally-occurring-radioactive-materials>

- The federal family, including DOE, NRC, and DOD in a 2002 report issued by the Interagency Steering Committee on Radiation Standards (ISCORS) entitled “A Method for Estimating Radiation Risk from Total Effective Dose Equivalent (TEDE)” stated that the simple method of converting dose to risk would not satisfy the need for a complex risk assessment such as those performed for CERCLA sites, and the federal family recommended utilizing slope factors when a complex risk assessment is needed for assessing radionuclides, such as at a CERCLA site. (See page 2 of the ISCORS Report) <http://www.iscours.org/doc/RiskTEDE.pdf>
- In a 1992 EPA SAB letter “Commentary on Harmonizing Chemical and Radiation Risk-Reduction Strategies”, the SAB acknowledged that EPA guidance for Superfund sites, which SAB described as governing DOE sites under CERCLA, would use a risk based approach similar to chemicals both for risk assessment and cleanup levels (e.g., no more than  $10^{-4}$  cancer risk). SAB viewed the harmonization of radionuclides to the chemical approach as scientifically valid. (See pages 9 and 12 of the SAB letter) [https://yosemite.epa.gov/sab/sabproduct.nsf/95eac6037dbec075852573a00075f732/b1397bac03c1197f85257324005274b5/\\$FILE/RADIATION%20RISK%20%20%20%20RAC-COM-92-007\\_92007\\_5-10-1995\\_144.pdf](https://yosemite.epa.gov/sab/sabproduct.nsf/95eac6037dbec075852573a00075f732/b1397bac03c1197f85257324005274b5/$FILE/RADIATION%20RISK%20%20%20%20RAC-COM-92-007_92007_5-10-1995_144.pdf)
- All 3 of EPA’s risk assessment PRG calculators have received external peer review. For example, the PRG calculator has received one independent peer review and two non-independent peer reviews, as described in the EPA document “Guidance on the Development, Evaluation, and Application of Environmental Models.” (See this website on the PRG calculator peer reviews [https://epa-prgs.ornl.gov/radionuclides/prg\\_peer\\_review.html](https://epa-prgs.ornl.gov/radionuclides/prg_peer_review.html))
- OSRTI has an interagency agreement DOE’s ORNL to develop and update based on new science and EPA policies the risk (PRG, BPRG, SPRG) and dose (DCC, BDCC, SDCC) assessment calculators for CERCLA assessments, as well as upcoming tools (RVISL, CPM). The Center for Radiation Protection Knowledge, which is part of ORNL's Environmental Sciences Division, manages this work. K. Z. Morgan, director of ORNL's Health Physics Division and an early recipient of the Swedish Royal Academy Gold Medal for Radiation Protection, started the ORNL Dosimetry Research Program in the 1950s. During development of the PRG and DCC calculators, Keith Eckerman, recipient of the 12th Swedish Royal Academy Gold Medal, led this program. Since its inception, the ORNL Dosimetry Research Program has provided the national and international scientific communities with models and data required to estimate doses and risks from exposure to radionuclides and establish exposure guidelines for radionuclides. EPA and DOE work together developing sound science. (See this website on the Center for Radiation Protection Knowledge <https://www.ornl.gov/crpk>)